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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------|-------------|----------------------|---------------------|------------------|
| 10/694,736 | 10/29/2003 | Florin Udrea | 011765-0306517 | 2647 |
| 909 | 7590 | 09/03/2004 | EXAMINER | |
| PILLSBURY WINTHROP, LLP | | | HOGANS, DAVID L | |
| P.O. BOX 10500 | | | ART UNIT | |
| MCLEAN, VA 22102 | | | PAPER NUMBER | |
| | | | 2813 | |

DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/694,736

Applicant(s)

UDREA ET AL.

Examiner

David L. Hogans

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10-29-03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the Transmittal of New Application filed on October 29, 2003.

Status of Claims

Claims 1-8 are pending.

Priority

1. Applicant's claim for domestic priority under 35 U.S.C. 119(e) and 120 is acknowledged.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on October 29, 2003, is in compliance with the provisions of 37 CFR 1.97, and accordingly, has been considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2 and 5-8 are rejected under 35 U.S.C. 102(e) as being anticipated by 6,124,179 to Adamic.

In reference to Claim 1, Adamic teaches:

- forming, in a layer provided on a semiconductor substrate, a power semiconductor device (212) having an active region that includes a drift region; (See Figures 2A-2F and columns 7-17 lines 41-42) and
- removing at least a portion of the semiconductor substrate (201 and 210) below at least a portion of the drift region such that said at least a portion of the drift region is provided in a membrane defined by that portion of the layer below which the semiconductor substrate has been removed (See Figures 2A-2F and columns 7-17 lines 41-42)

In reference to Claim 2, Adamic teaches:

- wherein said at least a portion of the semiconductor substrate is removed by wet etching (See Figures 2A-2F and columns 7-17 lines 41-42)

In reference to Claim 5, Adamic teaches:

- wherein at least one semiconductor layer (236) is introduced by implantation, diffusion or deposition from the back-side of the device following the formation of the membrane (See Figures 2A-2F and columns 7-17 lines 41-42)

In reference to Claim 6, Adamic teaches:

Art Unit: 2813

- wherein a bottom terminal layer (256) is applied to the bottom of the membrane, said bottom terminal layer being in contact with at least one semiconductor layer (236) within the membrane (See Figures 2A-2F and columns 7-17 lines 41-42)

In reference to Claim 7, Adamic teaches:

- comprising the step of applying an electrically insulating and thermally conductive layer (270) adjacent the bottom surface of the membrane (See Figures 2A-2F and columns 7-17 lines 41-42)

The Examiner notes that Merriam Webster's Collegiate Dictionary (2001), Tenth Edition, defines adjacent as "not distant : nearby".

In reference to Claim 8, Adamic teaches:

- wherein the electrically insulating and thermally conductive layer is applied by a deposition process (See Figures 2A-2F and columns 7-17 lines 41-42)

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by 6,444,487 to Boggs et al.

In reference to Claim 1, Boggs et al. teaches:

- forming, in a layer provided on a semiconductor substrate, a power semiconductor device (74) having an active region that includes a drift region; (See Figures 16-27 and columns 3-7 lines 65-24) and
- removing at least a portion of the semiconductor substrate (32) below at least a portion of the drift region such that said at least a portion of the drift region is provided in a membrane defined by that portion of the layer below which the semiconductor substrate has been removed (See Figures 16-27 and columns 3-7 lines 65-24)

In reference to Claim 3, Boggs et al. teaches:

- wherein said at least a portion of the semiconductor substrate is removed by dry etching (See Figures 16-27 and columns 3-7 lines 65-24)

In reference to Claim 4, Boggs et al. teaches:

- wherein said at least a portion of the semiconductor substrate is removed using a buried insulating layer (34) as an etch stop (See Figures 16-27 and columns 3-7 lines 65-24)

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Hogans whose telephone number is (571) 272-1691. The examiner can normally be reached on M-F (7:30-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DH

DH

A handwritten signature in black ink, appearing to read "Chau", with a long horizontal flourish extending to the right.